

TSEYTLIN, A.N.; SMIRNOVA, O.M.

Operation of a packed denitrating column under plant conditions.  
Izv.vys.ucheb.zav.;khim.i khim.tekh. 6 no.5:807-810 '63.

(MIRA 16:12)

1. Khar'kovskiy politekhnicheskii institut imeni Lenina,  
kafedra tekhnologii neorganicheskikh Veshchestv.

TSFYTLIN, A.N.; SMIRNOVA, O.M.

Checking the technological scheme of the combined production of  
sulfuric and nitric acids. Ukr. khim.zhur. 29 no.9:987-990  
'63. (MIRA 17:4)

1. Khar'kovskiy politekhnicheskii institut im. V.I.Lenina.

KASAB'YAN, S.S.; SMIRNOVA, O.M.

Some problems concerning the histochemical study of acid mucopolysaccharides in placental villi. Akush. i gin. 40 no.3:43-46 My-Je (MIRA 18:6) 1964.

1. Kafedra patologicheskoy anatomii (zav. - prof. S.S.Kasab'yan)  
Dagestanskogo meditsinskogo instituta, Makhachkala.

L 15562-66 EWT(1)/T IJP(e) GG  
ACC NR: AP6004410

SOURCE CODE: UR/0051/66/020/001/0096/0100 5/

AUTHOR: Ageyeva, N. K.; Dubovik, M. F.; Rybkin, Yu. F.; Sazonova, S. A.; Skoroboga-  
tov, B. S.; Smirnova, O. M.

ORG: none

TITLE: A method for producing lanthanon-activated cadmium fluoride crystals and an investigation of their luminescence

SOURCE: Optika i spektroskopiya, v. 20, no. 1, 1966, 96-100

TOPIC TAGS: calcium fluoride, cadmium compound, fluoride, phosphor crystal, rare earth element, luminescence, absorption spectrum 21, 44, 55

ABSTRACT: The authors report on a method for producing cadmium fluoride phosphor crystals activated by rare earth ions. The general nature of luminescence in these crystals is studied. The crystals were grown from anhydrous cadmium fluoride produced by sintering a mixture of cadmium oxide with ammonium fluoride. The hydrogen fluoride released during thermal decomposition converts the cadmium oxide into cadmium fluoride. Litmus paper may be used for determining the degree of conversion. The vapors released during the process are alkaline, changing to neutral or weakly

UDC: 535.37 : 548.0

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L 15562-66

ACC NR: AP6004410

acid at the end. This indicates decomposition of excess ammonium fluoride. The purity of the initial reagents has a strong effect on the quality of the product. Absorption spectra were used for checking the degree of purity of the final crystal. Crystals were produced with a transmission factor of 30% for a thickness of approximately 5 mm at a wave length of 200 mμ. Activator concentrations were 0.2, 1, 5 and 10 mol.% for CdF<sub>2</sub> crystals with NdF<sub>3</sub> and 0.2 mol.% for crystals with the other lanthanides. The following trivalent activating ions were studied: Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tu and Yb. A comparison of the luminescence spectra for these ions in cadmium fluoride and calcium fluoride crystals shows that in spite of the identical types of lattice and the close parameters, the behavior of rare earth ions in these crystals has very little in common. This is emphasized particularly in the luminescence spectra for trivalent Pr, Dy and Tb and in the absence of luminescence for thulium. The difference between these two matrices shows up in the valence of the impurity ions. For instance europium is usually bivalent in calcium fluoride, while it is always trivalent in cadmium fluoride. This may be explained by the difference in oxidation potentials for bivalent calcium and cadmium. Orig. art. has: 6 figures.

SUB CODE: 20/ SUBM DATE: 30Jul64/ ORIG REF: 002/ OTH REF: 008

Card 2/2

L 35066-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG S/0286/65/000/006/0019/0019  
ACCESSION NR: AP5008517  
AUTHOR: Rybkin, Yu. F.; Lebed', V. I.; Kresal'naya, L. Z.; Kipriyanova, S. S.;  
Smirnova, O. M.  
TITLE: A method for producing halides of alkali metals. Class 12, No. 169080  
SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 6, 1965, 19  
TOPIC TAGS: alkali halide, alkali metal  
ABSTRACT: This Author's Certificate introduces a method for producing halides of alkali metals, e.g. iodides and bromides, from a halogen and a compound which contains a metal. Highly concentrated halide solutions are produced by using an amalgam of the appropriate metal and carrying out the reaction in the halide of this metal.  
ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut monokristallov (All-Union Scientific Research Institute of Single Crystals)  
SUBMITTED: 21Jan63 ENCL: 00 SUB CODE: GC, IC  
NO REF SOV: 000 OTHER: 000  
Card 1/1

15

SMIRNOVA, O. N.

Combating the wild strawberry pest, Polish Coccus  
cacti. O. N. Smirnova. Sadovodstvo (U. S. S. R.) 1940,  
No. 11-12, 51-5. Chem. methods of combating Coccus  
cacti (anabasin sulfate, pyrethrum, *p*-dichlorobenzene)  
produced neg. results. Crop rotation is the only effective  
method. W. R. Henn

ASAC SEA METALLURGICAL LITERATURE CLASSIFICATION

SEARCHED INDEXED

RECEIVED

SMIRNOVA, O.N.

BA

Bitt-1

Control of current bagwormid boring beetle and clearwing moth.  
O. N. Smirnova (*Sad i Ogorod*, 1949, No. 9, 24-25; *Hort. Abslr.*,  
1950, 20, 24).—Control measures recommended include removal of  
all beetle-infested shoots, application of As spray in June to kill  
feeding larvae of the beetle, and, about 7 days later, application of a  
DDT or  $C_6H_5Cl$  dust to destroy adults of both species; this should  
be repeated in 7-10 days. A. G. POLLARD.



SMIRNOVA, O. N.

2-1

USSR/Plant Diseases. General Problems.

Abs Jour: Ref Zhur-Biol., No 6, 1958, 25319.

Author : Smirnova, O.N.

Inst :

Title : The Chief Diseases of Agricultural Crops and Methods  
of Controlling Them.  
(Osnovnyye bolezni sel'skokhozyaystvennykh kul'tur i  
mery bor'by s nimi).

Orig Pub: V.s.b.: Vopr. bor'by s vredit. boleznyami i sornyakami s.-  
kh. rast. v Tomskoy obl. Tomsk, Un-t, 1957, 45-53.

Abstract: The chief diseases of grains, flax, potatoes and  
vegetable crops encountered in Tomskaya Oblast' are  
described.

Card : 1/1

SOV-5-58-3-7/39

Several New and Specific Bryozoa Species of the Upper Cretaceous Period of the Southern Ural

There is 1 table, 2 photos, and 18 references, 6 of which are Soviet, 4 French, 2 English and 6 German.

1. Geology--USSR    2. Paleoecology--Study and teaching    3. Fossil Bryozoa--USSR

Card 2/2

SMIRNOVA, O.S.

SMIRNOVA, O.S.

Ollier's disease in a 16-year old boy. Ortop., travm. i protez.  
18 no.1:70 Ja-F '57. (MIRA 10:6)

1. Iz kafedry fakul'tetskoy khirurgii (zav. - prof. A.G.Karavanov)  
Kalininskogo meditsinskogo instituta (dir. - prof. R.P.Gavrilov)  
na baze oblastnoy bol'nitsy (glavnyy vrach - zasluzhennyy vrach  
RSFSR A.A.Sokolov)  
(PELVIS--DISEASES)

SMIRNOVA, O.S., agronom

Apparatus for agricultural laboratories. Zemledelie 25 no.7:66-67  
Jl '63. (MIRA 16:9)  
(Agricultural laboratories—Equipment and supplies)

SMIRNOVA,

O.V.

Distr: 01/22d  
Modern film materials and their uses. O. Ya. Fedotova  
and O. V. Smirnova. Khim. Nauka i Prom. 2, 613-21  
(1987). Analytical discussion. 97 references. I. B.

3

1

1/1

OK

S/241/63/008/003/003/003  
D296/D307

AUTHOR: Smirnova, O.V.

TITLE: The influence of preliminary vaccination with live anti-plague vaccine upon the radio-resistance of animals

PERIODICAL: Meditsinskaya Radiologiya, v. 8, no. 3, 1963, 66-70

TEXT: Plague vaccine stimulates the reticulo-endothelial and the haematopoietic system, causing a reaction of macrophages and hyperplasia. It is these systems which are above all affected by ionizing radiation. Earlier reports indicated that vaccines of the E. coli and Salmonella group increased the resistance to radiation. The author studied the influence of the EB strain of Pasteurella pestis which is widely used for immunization of humans, upon the radio resistance of white mice, guinea pigs and rabbits. It was found that in contrast to the above reports, vaccination with the EB strain decreases the resistance to radiation. This is, in the author's view, due primarily to the local inflammatory reaction

Card 1/2

SMIRNOVA, O.V.

Use of a photonephelometer for recording serological changes  
in the serum of animals irradiated and inoculated with anti-  
plague vaccine. Zhur. mikrobiol., epid. i immun. 40 no.3:  
117-118 Mr '63. (MIRA 17:2)

SMIRNOVA, O.V.

Effect of preliminary vaccination with live plague vaccine of  
radioresistance in animals. Med. rad. 8 no 3:66-70 Kz 1969.  
(PINA 1719)



USSR/Chemistry - Aromatic Hydrocarbons

Apr 51

"Interaction of Aromatic Compounds With Allyl Chloride and Allyl Alcohol in Presence of Acid Catalysts. I. Interaction of Benzene and Toluene with Allyl Chloride and Bromide in Presence of Aluminum Chloride," I. P. Losev, O. V. Smirnova, T. A. Pfeyfer, Lab of Moscow Chemicotech Inst. Iment D. I. Mendeleev

"Zhur Obshch Khim" Vol XXI, No 4, pp 668-676

Reacted allyl chloride with  $C_6H_6$  in presence of anhyd  $AlCl_3$  to form hydriene, 1,2-diphenylpropane, monallylbenzene, o- and p-diallylbenzenes,

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USSR/Chemistry - Aromatic Hydrocarbons Apr 51  
(Contd)

$\gamma$ -chloropropylbenzene, 9-methyl-9,10-dihydroanthracene. Conducted further expts to clarify structures. Allyl bromide reacted under similar conditions with  $C_6H_6$  to yield similar results, with toluene to yield 2,7,9-trimethyl-9,10-dihydroanthracene and side products 7-methylhydriene, 1,4-dimethyl-1,3-diphenylpropane, diene.

182T19

SMIRNOVA, O. V.

SMIRNOVA, O.V.

✓ Reaction of aromatic compounds with allyl chloride and allyl alcohol in the presence of acidic catalysts. II. Reaction of phenol with allyl alcohol in the presence of phosphoric acid. I. P. Losev, O. V. Smirnova, and L. P. Ryadneva (D.I. Mendeleev Chem. Technol. Inst., Moscow). *Sbornik Stekl. Obsch. Khim., Akad. Nauk S.S.S.R.* 1, 548-51 (1953); cf. *C.A.* 46, 10118a. —Heating 56.4 g. PhOH, 22 g. allyl alc., and 133.7 g. concd.  $H_2SO_4$  to 80° (the alc. being added over 1 hr. to the PhOH- $H_2SO_4$  mixt.) gave only a resinous mass. To 150 g.  $H_2PO_4$  (d. 1.70) and 74 g. PhOH heated to 70° was added over 6 hrs. a mixt. of 165 g.  $H_2PO_4$  and 55 g. allyl alc., the mixt. heated 3 hrs. at 70°, the layers sep'd., the upper layer washed with  $H_2O$ , and the aq. layer ext'd. with  $Et_2O$ . After removal of solvent from the combined upper layer and  $Et_2O$  ext., distn. of the products gave a mixt. from which were isolated 12% isopropenylphenol (probably the *o*-isomer), b. 204-5°,  $d_4^{20}$  1.0571,  $n_D^{20}$  1.500 (bromide, m. 85°); 11.5% 2-methylcoumaran, b. 210-11°,  $d_4^{20}$  1.0692,  $n_D^{20}$  1.549; 11% chroman, b. 215-16°, and a resinous residue, which was apparently a polymer of *o*-isopropenylphenol. If more concd. acid were used, the yields of such products decline even at lower temp.

G. M. Kosolapoff

5(3)

AUTHORS:

Losev, I. P., ~~Smirnova, O. V.~~,  
Konazhevskiy, A. S.

SOV/153-58-6-16/22

TITLE:

Synthesis of the Esters of the  $\alpha$ -Chloro Acrylic Acid (Sintez efirov  $\alpha$ -khlorakrilovoy kisloty). I. Synthesis of the Methyl Ester of  $\alpha$ -Chloro Acrylic Acid (I. Sintez metilovogo efira  $\alpha$ -khlorakrilovoy kisloty)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 6, pp 93-96 (USSR)

ABSTRACT:

The authors give the various production methods of the methyl ester of  $\alpha$ -halogen-substituted acrylic acid (Refs 1-14) and discuss them by means of schemes. The production (synthesis) given in the subtitle is discussed first in the experimental part. It consists of: production of the methyl ester of  $\alpha, \beta$ -dichloro propionic acid (Table 1) and of the dehydrochlorination of the methyl ester of the last mentioned acid. 2 fractions were obtained: 1) 69-70%, boiling point 65-68° at 50-52 mm. 2) 18-20%, boiling point 73-75° at 50-52 mm. According to the analysis, the second fraction is enriched with methyl

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Synthesis of the Esters of the  $\alpha$ -Chloro Acrylic Acid. SOV/153-58-6-16/22  
I. Synthesis of the Methyl Ester of  $\alpha$ -Chloro Acrylic Acid

ester of  $\alpha, \beta$ -dichloro propionic acid. From two experimental series we may conclude that in the case of the application of 25% NaOH-solution as dehydrochlorinating reagent a product is obtained which approaches most closely the methyl ester of the  $\alpha$ -chloro acrylic acid. This ester is an achromatic liquid with characteristic lachrimatory properties. It causes burns of the skin. Then the production of the mentioned ester from  $\alpha$ -chloro acrylic acid and trichloro ethylene is described. The dependence of the yield in esters with regard to time was determined for an experiment with the following quantity of reacting substances: trichloro ethylene 100.0 g (0.763 mole), formalin (of 30%) 76.3 g (0.763 mole), sulphuric acid 316.0 g (3.230 mole), methyl alcohol 30.6 g (0.957 mole), and copper carbonate (as inhibitor of the polymerization) 1.3 g (Fig 1). This shows that the maximum yield (75% of the theory) of the methyl ester of  $\alpha$ -chloro acrylic acid is obtained within 3 hours. The yield is reduced in the case of a further heating of the reaction mass. The dependence of the ester yield on the  $H_2SO_4$  quantity is shown in table 2. The waste acid has a concentration of 40-50%. The temperature

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Synthesis of the Esters of the  $\alpha$ -Chloro Acrylic Acid. SOV/153-58-6-16/22  
I. Synthesis of the Methyl Ester of  $\alpha$ -Chloro Acrylic Acid

of the reaction amounted to 75<sup>0</sup>. There are 2 figures, 1 table,  
and 14 references.

ASSOCIATION: Kafedra tekhnologii vysokomolekulyarnykh soyedineniy,  
Moskovskiy ordena Lenina khimiko-tekhnologicheskii institut  
imeni D. I. Mendeleyeva (Chair of the Technology of High-  
Molecular Compounds, Moscow "Order of Lenin" Institute  
of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: February 7, 1958

Card 3/3

69-58-2 -21/23

AUTHOR: Smirnova, O. V.  
 TITLE: The 80th Anniversary of Ivan Platonovich Losev [Ivan Platonovich Losev (k 80-letiyu so dnya rozhdeniya)]  
 PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 2, pp 246-247 (USSR)  
 ABSTRACT: Losev was born January 16, 1878. In 1919 he began his scientific career as assistant of Professor P.P. Shorygin in the Moscow Veterinary Institute. Since 1923, Professor I.P. Losev has worked in the Moskovskiy khimiko-tekhnologicheskii institut imeni D.I. Mendeleeva (Moscow Chemical Technological Institute imeni D.I. Mendeleev). In 1932, he organized the first chair for plastics in the institute. His own work is concerned with the chemistry and technology of high-molecular compounds, with the reaction of polymerization of vinyl chloride, of simple vinyl esters and of the derivatives of alpha-chloracrylic acid, with the copolymerization of vinyl derivatives of alpha-chloracrylic acid, with the condensation of phenol and aniline together with various aldehydes. Since 1943, he has studied the synthesis of polyester urethanes, polyamides, polyurea, and the cation exchange resin sorbents. In 1948, he organized the chair for the technology of high-molecular compounds, and in 1957 the laboratory for ion exchange resin sorbents. In 1956 Losev was elected president

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The 80th Anniversary of Ivan Platonovich Losev

69-58-2 -21/23

of the All-Union Chemical Society imeni D.I. Mendeleev.  
There is 1 photo.

1. Biography

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SMIRNOVA, O. V.

79-2-1/14

AUTHORS:

IZ. BOV, I. P. , Smirnova, O. V.

TITLE:

The Interaction of Aromatic Compounds With Alcohols in the Presence of Acid Catalysts (Vzaimodeystviya aromaticeskikh soedineniy so spirtami v prisutstvii kislolykh katalizatorov)  
III. The Interaction of Phenol With Diols in the Presence of Phosphoric Acid (III. Vzaimodeystviye fenola s diolami v prisutstvii fosforney kisloty)

PERIODICAL:

Zhurnal Obshchey Khimii, 1958, Vol. 30, Nr. 2, pp. 365 - 365 (USSR)

ABSTRACT:

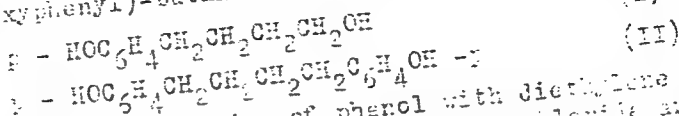
The authors continued their investigations of the interaction between aromatic compounds and alcohols in the presence of acid catalysts. Their next aim was the reaction of the interaction between phenol and diol. 1,4- and 1,3-butane diols served as test objects. In publications there exist no indications to the performance methods of a condensation reaction of phenols with diols alcohols. They were performed analogous to the condensation reactions of phenols with monoatomic alcohols in the presence of acid catalysts. The authors carried out the condensation of phenol with diatomic alcohols, diethylene glycol, 1,3- and 1,4-butane diol - in the presence of aluminum chloride and phosphoric acid. Positive results were obtained in the condensation with 1,4-butane diol in the pre-

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The Interaction of Aromatic Compounds With Alcohols in the Presence of Acid Catalysts. III. The Interaction of Phenol With Diols in the Presence of Phosphoric Acid

Diols of phosphoric acid. On that occasion two substances were obtained - 4-(p-oxyphenyl)-butanol-1 (I) and 1,4-(p,p'-dioxylphenyl)-butane (II).



The reaction of the condensation of phenol with diethylene glycol and 1,3-butane diol in the presence of aluminum chloride and phosphoric acid leads to the formation of tarry products which are soluble in benzene, alcohols and other organic solvents. It is not possible to eliminate individual organic compounds. Conclusions: 1) The interaction of ethylene glycol and 1,3-butane diol with phenol in the presence of  $\text{AlCl}_3$  and  $\text{H}_3\text{PO}_4$  leads to the formation of tarry products which are soluble in most organic solvents. 2) The interaction of 1,4-butane diol with phenol in the presence of  $\text{H}_3\text{PO}_4$  leads to the formation of 4-(p-oxyphenyl)-butanol-1 and 1,4-(p,p'-dioxylphenyl)-butane (II). The optimum conditions for the performance of this reaction are the heating of the reaction mixture to 200-220°C in diluted phosphoric acid (d 1.5). These are much better conditions than in the performance of the reaction with monatomic alcohols which are given by many authors in publications. Simultaneously with (I) and (II) tarry products form

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The Interaction of Aromatic Compounds With Alcohols in the Presence of Acid Catalysts. III. The Interaction of Phenol With Diols in the Presence of Phosphoric Acid

Which are soluble in benzene and acetone (references 1, 3 and 15).  
There are 17 references, 9 of which are Slavic.

ASSOCIATION: Moscow Chemical and Technological Institute imeni D. I. Mendeleev  
(Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleeva)

SUBMITTED: December 10, 1956

AVAILABLE: Library of Congress

Card 5/3

79-28-4-31/60

AUTHORS:

Losev, I. P.; Smirnova, O. V.

TITLE:

Interaction of the Aromatic Compounds With Alcohols in the Presence of Acidous Catalysts (Vzaimodeystviye aromaticheskikh soedineniy so spirtami v prisutstvii kislykh katalizatorov) IV. Interaction of Benzene With Polyatomic Alcohols in the Presence of Acidous Catalysts (IV. Vzaimodeystviye benzola s mnogoatomnymi spirtami v prisutstvii kislykh katalizatorov)

PERIODICAL:

Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 4, pp. 991-994 (USSR)

ABSTRACT:

The investigation of the interaction reaction of benzene with different polyatomic alcohols in the presence of acidous catalysts shows the possible production of new saturated and unsaturated benzene derivatives (phenylpropanol, phenylbutene and others), which would be suited for the synthesis of plasticizing products and polymeric compounds. When carrying out the interaction reaction of benzene with diols the authors relied on data from previous investigations (Refs 1 to 8). At first benzene was condensed by butane-diol-1,4- and -1,3 in the presence of

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79-28-4-31/60

Interaction of the Aromatic Compounds With Alcohols in the Presence of  
Acidous Catalysts. IV. Interaction of Benzene With Polyatomic Alcohols  
in the Presence of Acidous Catalysts

$H_3PO_4$  and  $AlCl_3$ . It has been ascertained that the interaction of benzene with butane-diol-1,4 leads to the formation of tarry products and with butane-diol-1,3 to 3-phenyl-butanol-1 and 1,3-diphenylbutane. The dehydration was a separate problem, as it is known from publications (Refs 9 and 19) that the extension of the radical of the respective alcohol makes its dehydration more difficult. The dehydration was carried out under the conditions suggested for the primary phenylethyl alcohol (Refs 9, 11, 12). The highest yield of 2-phenyl-butene-3 (56 %) is obtained in the presence of alumo-silica gel at 140-160°C. From polymerization of 2-phenyl-butene-3 together with styrol copolymers with different contents of initial compounds were obtained. Furthermore, the condensation of benzene with glycerol in the presence of  $H_3PO_4$ ,  $AlCl_3$ ,  $FeCl_3$  and  $H_2SO_4$  was investigated. Positive results were obtained in the presence of  $AlCl_3$  at 100-102°C and 5,5 - 6,0 atmospheres in the autoclave. The result of the reaction were two products: 2-phenyl-propane-diol-1,3

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Interaction of the Aromatic Compounds With Alcohols in the Presence of Acidous Catalysts. IV. Interaction of Benzene With Polyatomic Alcohols in the Presence of Acidous Catalysts

and 2,3-diphenylpropanol-1. There are 16 references, 14 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut imeni D. I. Mendeleyeva  
(Moscow Institute for Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: December 11, 1956

Card 3/3

79-28-4-32/60

AUTHORS: Losev, I. P., Smirnova, O. V.

TITLE: Interaction of the Aromatic Compounds With Alcohols in the Presence of Acidous Catalysts (Vzaimodeystviye aromatischeskikh soedineniy so spirtami v prisutstvii kislykh katalizatorov) V. Interaction of Benzene With Polyvinyl Alcohol in the Presence of Acidous Catalysts (V. Vzaimodeystviye benzola s polivinilovym spirton v prisutstvii kislykh katalizatorov)

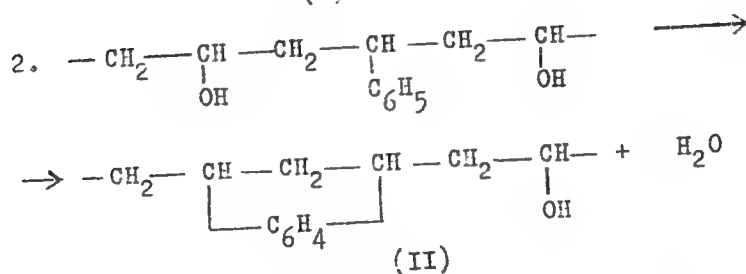
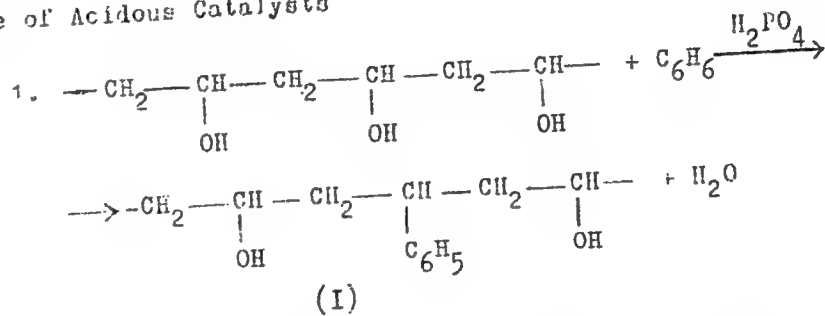
PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 4, pp. 994-998 (USSR)

ABSTRACT: In the present paper the authors condensed benzene with polyvinylalcohol and used  $H_3PO_4$  and  $AlCl_3$  as catalyst. On this occasion a red-brown product developed which swelled in water, alcohol, benzene and acetone. From oxidation of the reaction product by potassium bichromate phthalanhydride and benzoic acid were obtained. This refers to the inclusion of phenyl rings in the chain of polyvinylalcohol. The analysis represents the reaction process in the following scheme:

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79-28-4-32/60

Interaction of the Aromatic Compounds With Alcohols in the Presence of Acidous Catalysts. V. Interaction of Benzene With Polyvinyl Alcohol in the Presence of Acidous Catalysts

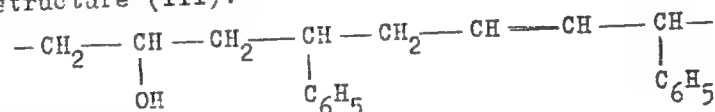


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79-28-4-32/60

Interaction of the Aromatic Compounds With Alcohols in the Presence of Acidous Catalysts. V. Interaction of Benzene With Polyvinyl Alcohol in the Presence of Acidous Catalysts

The number of hydroxyl groups substituted by the phenyl ring depends on the quantity of catalyst and on the reaction time. The investigation of the reaction products (1,3-diphenylpentane) of polyvinylalcohol with benzene in the presence of  $AlCl_3$  was carried out by means of infrared spectroscopy, using a layer of 0,01 mm thickness (Refs 2 and 3). From the analysis partial substitution of the hydroxyl groups by phenyl radicals can be ascertained. Consequently the polymer can obtain the structure (I) and (II). At the same time the development of double bonds is also possible. By this the polymer can acquire the structure (III):



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Interaction of the Aromatic Compounds With Alcohols in the Presence of Acidous Catalysts. V. Interaction of Benzene With Polyvinyl Alcohol in the Presence of Acidous Catalysts

The presence of a double bond (III) conditions the development of diagonal bonds between the single polymer molecules. This is confirmed by the poor solubility of the product after the reaction. There are 1 figure, 4 tables, and 3 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut imeni D. I. Mendeleeva)  
(Moscow Institute for Chemical Technology imeni D. I. Mendeleev)

SUBMITTED: December 24, 1956

Card 4/4

5(1,3)  
AUTHORS:

SOV/153-2-4-23/32  
Losev, I. P., Smirnova, O. V., Bodnar, E., Lutsenko, L. M.,  
Konazhevskiy, A.

TITLE:

Synthesis of  $\alpha$ -Chloroacrylic Acid Ester:

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya  
tekhnologiya, 1959, Vol 2, Nr 4, pp 589 - 593 (USSR)

ABSTRACT:

A report on this paper was given at the All-Union Conference on "Ways of Synthesis of Initial Products for the Production of High Polymers" which took place in Yaroslavl from September 29 to October 2, 1958. Among the polymer synthetics, gaining more and more importance, the acryl derivatives are outstanding because of their many valuable properties. On the other hand, polymers obtained from the derivatives of acrylic and methacrylic acid esters show considerable shortcomings such as little resistance to heat, wear, and crack formation. One of the ways of eliminating these shortcomings is polymer production on the basis of the esters mentioned in the title. Only  $\alpha$ -substituted esters can be used (Refs 1,2). After giving a survey of publications (Refs 3-9), the authors state that the synthesis of the esters mentioned in the title in the presence of concentrated  $H_2SO_4$  and

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Synthesis of  $\alpha$ -Chloroacrylic Acid Esters

SC7/153-2-4-23/32

alcohol is of high practical interest (because the initial substances triethylene chloride and formaldehyde are easy to obtain) (Ref's 11,12). In the paper under review, publication data on the synthesis of methyl esters were taken into consideration, and the way of synthesis of other esters (ethyl, n.propyl-, isopropyl-, n.butyl-, isobutyl-, isoamyl-, and cyclohexyl-ester) were investigated. The synthesis of the acid mentioned in the title with an extended carbon chain has been little described in publications (Ref 4). Acrylic acid ester, acrylonitrile, and triethylene chloride were used as raw materials. Starting from the former, any esters can be synthesized in two stages: a) synthesis of the ester of  $\alpha,\beta$ -dichloropropionic acid, b) dehydrochlorination of dichloro derivatives obtained from propionic acid by means of various separating agents. C o n c l u s i o n s : 1) In the chlorination of acrylic acid esters by means of gaseous chlorine in the presence of dimethyl formamide, corresponding esters of  $\alpha,\beta$ -dichloropropionic acid are formed with a yield of more than 90% (of the theoretical yield). 2)  $\alpha,\beta$ -dichloropropionitrile was formed by direct chlorination of acrylonitrile under the same conditions. This method of chlorination is new.

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Synthesis of  $\alpha$ -Chloroacrylic Acid Esters

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3) Preparation of esters of the acid mentioned under 1) from the substance mentioned under 2) gives a yield of up to 75%, it is convenient, and interesting with regard to waste utilization of acrylonitrile production. 4) By means of chlorination, saponification, and esterification of acrylonitrile, various esters of dichloropropionic acid can be obtained in one process (yield up to 80%). 5) Sodium acetate proved to be the best separating agent in dehydrochlorination of the ester of  $\alpha, \beta$ -dichloropropionic acid (yield of 80%). 6) Various esters can be obtained in the preparation of the esters of  $\alpha$ -chloroacrylic acid from triethylene chloride and formaldehyde in the presence of the respective alcohol and  $H_2SO_4$ . The ester yield decreases with in-

creasing chain length of the alcohol radical. No esters are formed if isoamyl- and cyclohexyl alcohol are used. There are 2 figures, 1 table, and 12 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy khimiko-tehnologicheskii institut imeni D. I. Mendeleeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleev)

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LOSEV, I.P.; SMIRNOVA, O.V.; LUTSENKO, L.M.

Synthesis of isoalkyl esters of  $\alpha$ -chloroacrylic acid. Trudy MKHTI  
no.29:17-25 '59. (MIRA 13:11)

(Acrylic acid)

S/629/60/000/003/004/011  
D202/D305

AUTHORS: Losev, I. P., Gordon, G. Ya., Smirnova, O. V., and Yakubovich, A. Ya.

TITLE: Polycarbonates

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo imeni D. I. Mendeleeva. Uspekhi khimii i tekhnologii polimerov, sb. 3, Moscow, goskhimizdat, 1960, 47-66

TEXT: An extensive survey of the above new thermoplastic materials, based exclusively on Western work. The authors describe the starting materials for preparing polycarbonates, methods of synthesis, properties and possible applications, stating that most of the available data refer to products based on 2,2-bis (4-oxyphenyl) propane and its homologues. 27 compounds of this series are cited and their melting and softening points, structural formulae and mechanical properties are tabulated. There are 7 tables and 35 non-Soviet-bloc references. The 4 most recent references to the English-language publications read as follows: K. J. Thompson and K. B. ✓

Card 1/2

Polycarbonates

S/629/60/000/003/004/011  
D202/D305

Goldblum, Ind. Plast. Mod., 10, no. 5, 40, (1958); H. Schnell, Ind. Eng. Chem., 31, 157, (1959); C. V. Schulz and A. Horbach, Macromol. Chem., 29, 1-2, 93, (1959); E. F. Fildler, W. F. Christopher and T. R. Calkins, Mod. Plastics, 36, no. 8, 115, (1959). ✓

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85415

S/190/60/002/011/011/027  
B004/B060

15.8109

AUTHORS:

Losev, I. P., Smirnova, O. V., Fortunatov, O. G.,  
Neklyudov, A. D.

TITLE:

Study of Interfacial Polyesterification

PERIODICAL:

Vysokomolekulyarnyye soyedineniya. 1960. Vol 2. No 1,  
pp. 1659 - 1664

TEXT: The authors report on their experiments on interfacial formation of polyesters and on data found concerning the dependence of the properties of polymers obtained on the components applied, as well as concerning the effect of reaction conditions. Polyesters were synthesized at a 1:1 ratio of the components to one another, a concentration of 0.05 mole/l, 20°C, reaction time 30 min, and rpm of the stirrer 1200 r/min. The components used were bivalent alcohols (phenols) and dicarboxylic acids. Results are given in Table 1. ✓

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Study of Interfacial Polyesterification

S/190/60/002/011/011/027  
B004/B060

Table 1

glycol	acid chloride	polyester soluble in:	melting point, °C	film
HO (CH <sub>2</sub> ) <sub>2</sub> OH	ClOC-C <sub>6</sub> H <sub>4</sub> -COCl	cresol, dimethyl formamide	215	stable, transparent
HO (CH <sub>2</sub> ) <sub>4</sub> OH	ClOC-(CH <sub>2</sub> ) <sub>8</sub> -COCl	acetone, toluene, methylene chlo- ride	82-83	little stable
dto	ClOC (CH <sub>2</sub> ) <sub>4</sub> COCl	dto.	65 66	dto
m C <sub>6</sub> H <sub>4</sub> (OH) <sub>2</sub>	ClOC-C <sub>6</sub> H <sub>4</sub> -COCl	cresol	not melting	
dto.	ClOC-(CH <sub>2</sub> ) <sub>8</sub> -COCl	acetone, toluene, methylene di- chloride	118-120	little stable
dto.	ClOC-(CH <sub>2</sub> ) <sub>4</sub> -COCl	dto.	98-100	dto.
HO C <sub>6</sub> H <sub>4</sub> - $\begin{array}{c} \text{CH}_3 \\   \\ \text{C} \\   \\ \text{CH}_2-\text{CH}_2 \end{array}$ -C <sub>6</sub> H <sub>4</sub> -OH	ClOC-C <sub>6</sub> H <sub>4</sub> -COCl	cresol, dimethyl formamide	340-345	stable film

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Study of Interfacial Polyesterification

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Continuation of Table 1				
glycol	acid chloride	polyester soluble in:	melting point °C	film
dto.	$\text{ClOC}-(\text{CH}_2)_8-\text{COCl}$	acetone, toluene		rubber-like
dto.	$\text{ClOC}-(\text{CH}_2)_4-\text{COCl}$	dto		dto
$\text{HO}-\text{C}_6\text{H}_4-\text{C}(\text{C}_6\text{H}_5)_2-\text{C}_6\text{H}_4-\text{OH}$	$\text{ClOC}-\text{C}_6\text{H}_4-\text{COCl}$	cresol	not melting	
dto.	$\text{ClOC}-(\text{CH}_2)_8-\text{COCl}$	acetone, toluene methylene chlo- ride	48-50	stable trans- parent film
dto.	$\text{ClOC}-(\text{CH}_2)_4-\text{COCl}$	acetone, toluene	94-96	very solid, transparent
$\text{HO}-\text{C}_6\text{H}_4-\text{C}(\text{CH}_3)_2-\text{C}_6\text{H}_4-\text{OH}$	$\text{ClOC}-\text{C}_6\text{H}_4-\text{COCl}$	cresol	339-340	stable film

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Study of Interfacial Polyesterification

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S/190/60/002/011/011/027  
B004/B060

Continuation of Table 1

glycol	acid chloride	polyester soluble in:	melting point °C	film
dto.	C10C-(CH <sub>2</sub> ) <sub>8</sub> -COCl	acetone, toluene	-	rubber like
dto.	C10C-(CH <sub>2</sub> ) <sub>4</sub> -COCl	dto.	-	dto.

Polyesters from 4,4'-dihydroxy diphenyl methyl ethyl methane and adipic chloride or sebacic chloride yield stable transparent films with good adhesion to glass and metal. Aliphatic glycols exhibited a low reactivity and gave poor yields. Copolymerization of 4,4'-dihydroxy diphenyl cyclohexane with adipic chloride (AC) and terephthalic chloride (TPC) under the same conditions as before, gave the following results:

Table 2

TPC:AC	melting point	solubility	TPC:AC	melting point	solubility
100:0	not melting	insoluble	60:40	164-166	in m-cresol, di-
90:10	276-278	in m-cresol	50:50	138-140	methyl formamide
80:20	238-240	dto.			in dimethyl for-
70:30	185-190	dto.			amide, m-cresol

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Study of Interfacial Polyesterification

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Continuation of Table 2

TPC:AC	melting point	solubility	TPC:AC	melting point	solubility
40:60	140-142	in dimethyl formamide, m-cresol	20:80	108-110	dimethyl formamide, cresol, toluene, acetone
30:70	118-122	dto.	10:90	98-102	dto.

With rising TPC content the ability to form films is reduced to diminished solubility. The effect of the concentration of the components, their initial ratio, temperature, alkali added, reaction time, upon the intrinsic viscosity (determined by an Ostwald-Pinkevich viscosimeter) and yield was examined by the example of 4,4'-dihydroxy diphenyl-2,2-propane (Dian) and TPC. The results are as follows: 1) The reaction proceeds most readily with Dian excess. Increase of concentration of components increases viscosity and yield. 2) The optimum initial component concentration is 0.11 mole/l for viscosity, 0.13 mole/l for yield. 3) This difference of the maxima of 0.02 mole/l is eliminated, if NaOH is added with an excess of 0.5 mole per mole of Dian. Viscosity and yield then attain a maximum at

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Study of Interfacial Polyesterification

S/190/60/002/011/011/027  
B004/B060

0.1 mole/l. 4) Viscosity and yield drop with rising NaOH concentration, as NaOH enters into reaction with the acid chloride 5) Optimum temperature is 18-20°C. 6) Optimum reaction time is 25 min for maximum viscosity, while the maximum yield is already attained after 15 min. There are 2 figures, 2 tables, and 5 references: 3 Soviet, 2 US and 1 British

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im.  
D. I. Mendeleyeva (Moscow Institute of Chemical Technology  
imeni D. I. Mendeleyev)

SUBMITTED: May 6, 1960

Card 6/6

85416

S/190/60/002/011/0:2/027  
B004/B060

15.8108

AUTHORS: Losev, I. P., Smirnova, O. V., Smurova, Ye. V.

TITLE: Synthesis and Study of the Products of Interaction of  
4,4'-Dihydroxy Diphenyl-2,2-propane With Diphenyl Ester of  
Carbonic Acid

PERIODICAL: Vysokomolekulyarnyye soyedineniya, '960, Vol. 2, No. 11,  
pp. 1665 - 1670

TEXT: The authors wanted to study the reaction conditions accompanying the formation of polycarbonates. The reaction with carbonic acid esters is very incompletely described in the literature. The authors synthesized  $\text{CO}(\text{OC}_6\text{H}_5)_2$  from alkaline phenol solution and phosgene. Dian (4,4'-dihydroxy diphenyl-2,2-propane) was used as the second component. The reaction took place in silicone oil bath. The thermal treatment was extended over 2-3 hours at 200-210°C and 50-60 mm Hg, and subsequently, in high vacuum over 3-5 hours to attain even higher temperatures. The polymer was reprecipitated from the solution to methylene chloride. Results are given in

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Synthesis and Study of the Products of Inter- S/190/60/002/011/012/027  
action of 4,4'-Dihydroxy Diphenyl-2,2'-propane B004/B060  
With Diphenyl Ester of Carbonic Acid

two tables. Table 1: Dependence of the polymer properties on the ratio of the initial components

initial components. mole		molecular weight of polymer	yield of reprecipitated polymer referred to to- tal amount of polymer obtained, %	melting point °C	phenol set free g
Dian	CO(OC <sub>6</sub> H <sub>5</sub> ) <sub>2</sub>				
	2.5	4000	15	118-125	6
	2	3980	27		6.3
	1.5	6300	84	215-218	8.55
	1	5900	65	217-220	6.84
	0.5	3980	60.9		5
	0.2	4680	42	193-203	5
2	1	4160	38.8	165-180	4
1.5	1	556	30		4.5
2	1	2370	1	110-118	
2.5	1				

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Synthesis and Study of the Products of Inter- S/190/60/002/011/012/027  
 action of 4,4'-Dihydroxy Diphenyl-2,2-propane B004/B060  
 With Diphenyl Ester of Carbonic Acid

Table 2: Dependence of molecular weight of polycarbonate on pressure during reaction

pressure, mm Hg		molecular weight of polycarbonate
in the 1st stage of process	in the 2nd stage of process	
760	10-15	6300
50-70	2-5	10,700
50-70	1.2	15,000
50-70	0	20,700
2-5	1-2	insoluble

A study was also made of the effect of inert gas in the first stage of reaction and the effect of the following catalysts:  $H_2SO_4$ ;  $Ti(OC_4H_9)_4$ ; dco. solved in butanol; Na; K; Na, and, in the second stage,  $ZnCl_2$ ; K, and in the second stage,  $ZnCl_2$ ; ZnO;  $Ti(OC_4H_9)_4$  in butanol and  $ZnCl_2$  in the second stage;  $Ti(OC_4H_9)_4$  and, in the second stage,  $ZnCl_2$ ; ZnO-PbO, and

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85416

Synthesis and Study of the Products of Inter- S/190/60/002/011/012/627  
action of 4,4'-Dihydroxy Diphenyl-2,2-Propane B004/B060  
With Diphenyl Ester of Carbonic Acid

finally, the effect of reaction time on the molecular weight was studied. Results are as follows: 1) polycarbonates were obtained with molecular weight from 20,000 to 30,000. 2) The reaction takes place stepwise. The chief polymer mass is formed after 60 - 90 min, but from 5 to 6 hours are required for attaining a high molecular weight. 3) 50 - 60 mm Hg in the first stage, and 1 - 2 mm Hg in the second ensure the production of a polymer with a high molecular weight. The feeding of inert gas promotes intermixing and reaction rate in the first stage, whereas in the second stage the gas disturbs, because it increases the pressure. 4) The best catalytic effects were exhibited by tetrabutoxy titanium and zinc oxide. 5) In order to obtain polymerizates usable as films or lacquers in the practice, it is necessary to observe the ratio of 1.5:1 or 1.2:1 between diphenyl carbonate and diene. There are 4 figures, 3 tables, and 11 references: 1 Soviet, 4 US, 3 British, and 3 German

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im  
D. I. Mendeleyeva (Moscow Institute of Chemical Technology  
imeni D. I. Mendeleyev)

SUBMITTED: May 9, 1960  
Card 4/4

83252

8/063/60/005/004/002/003

A003/A001

5.3832

AUTHORS:

Losev, I.P., Smirnova, O.V., Smurova, Ye.V.

TITLE:

The Synthesis and Investigation of Polycarbonates<sup>1</sup> Obtained by the Method of Reesterification

PERIODICAL:

Zhurnal vsesoyuznogo khimicheskogo obshchestva im. D.I. Mendeleeva, 1960, Vol. 5, No. 4, c. 478

TEXT:

Polycarbonates were obtained by reesterification and the effect of various conditions on the reaction was studied. The experiments were carried out in two series: with n-xylyleneglycol and dimethyl, diethyl and diphenyl esters of the carbonic acid; polyesters were obtained with a molecular weight of 550-4,700 and a high content of hydroxyl groups (2-6%); in the second series 4,4-dioxydiphenyl-2,2-propane (dian) and diphenyl ester of the carbonic acid were used. The properties of the polyester are affected in a high degree by the purity of the initial products. An excess of diphenyl carbonate has a more favorable effect on the polyester than an excess of dian. In experiments with an equal excess of diphenyl carbonate or dian polycarbonates were obtained with a molecular weight of 6,500 and 4,500, m.p. 217-225 and 190-200°C, and a content of hydroxyl groups of

Card 1/2

LOSEV, I.I.; SILECH, G.V.; GOL, S.I.; LUTSENKO, L.I.;  
KONCHENKO, A.S.

Polymerization of  $\alpha$ -chloroacrylic acid esters. Izv.vys.ucheb.  
zav.;khim.i khim.tekh. 4 no.3:471-476 '61. (MIRA 14:10)

1. Moskovskiy khimiko-tekhnologicheskii institut imeni  
Mendeleeva, kafedra tekhnologii vysokomolekulyarnykh  
soyedineniy.

(Acrylic acid)  
(Polymerization)

17 1450

15 8330

32357  
S/191/62/000/001/001/006  
B145/B110

AUTHORS: Losev, I. P., Smirnova, O. V., Kovarskaya, L. B., Poyenaru, V.

TITLE: Synthesis and investigation of copolymerization products of salts of  $\alpha$ -chloro acrylic acid with other acryl derivatives

PERIODICAL: Plasticheskiye massy, no. 1, 1962, 3-8

TEXT: The Pb, Ni, Co, and Cd salts of  $\alpha$ -chloro acrylic acid (I) as well as polymers on this basis were synthesized. The lead salt was produced from  $\text{Pb}(\text{OH})_2$  and I in aqueous solution ( $100^\circ\text{C}$ ) (yield 89.1%) and by reaction of  $\text{Pb}(\text{Ac})_2$  with I in ethereal solution ( $30^\circ$ ) (85%). It is insoluble in water, acetone, benzene, dichloro ethane, ether, and alcohol but soluble in dioxane and hot I, and has a crystalline structure. The Co, Ni, and Cd salts were prepared from the corresponding diacetates and from I in yields of 96, 97.5, and 96%, respectively. All four salts have no melting point, but start decomposing at  $200-220^\circ\text{C}$ . Elementary analysis provided the formula  $\text{C}_6\text{H}_4\text{Cl}_2\text{O}_4\text{Me}$  (Me = Ni, Co, Cd). Addition of 0.2% Pb salt and 0.2% I during the polymerization of the isobutyl ester of I in the presence of benzoyl peroxide at  $70^\circ\text{C}$  increases the thermal stability from 90 to  $160^\circ\text{C}$ . The

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32357

S/191/62/000/001/001/006

B145/B110

Synthesis and investigation ...

copolymerizate is transparent and colorless, has a comparatively small low-molecular portion and a low polydispersity. Copolymerizates obtained from 95% methyl methacrylate, 4.2% I, 0.3% Me salt (Me = Ni, Co, Cd) of I, and 0.5% benzoyl peroxide at 60 to 65°C and by ultraviolet irradiation are glassy materials which do not melt, begin to decompose at 200-260°C, and the thermal stability of which is higher by 70-90°C than that of polymethyl methacrylate alone. The polymerizates are soluble in most organic solvents and concentrated acids, swell in dilute acids and lyes and also in concentrated HNO<sub>3</sub>, and partially hydrolyze in boiling water. For Me = Co, Brinell hardness and specific gravity are 17.7 and 1.04 g/cm<sup>3</sup>, respectively; for Me = Ni, 18.7 and 1.044 g/cm<sup>3</sup>, respectively; and for Me = Cd, 22.7 and 1.35 g/cm<sup>3</sup>, respectively. The infrared spectrum of the copolymerizate with Co has bands which are characteristic of CH<sub>3</sub> and COOH groups. The Debye pattern indicated an amorphous structure. 1.5 mm thick samples of the polymerizate are impermeable to ultraviolet light of 240-400 mμ. If the reaction mixture is not irradiated with ultraviolet light during the polymerization process, impermeability to ultraviolet light only exists from 240 to 300 mμ. Consequently, the copolymerizate with Co salt of I is suitable for the production of ultraviolet filters.

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Synthesis and investigation ...

32357  
S/191/62/000/001/001/006  
B145/B110

There are 12 figures, 1 table, and 15 references: 10 Soviet and 5 non-Soviet. The 3 references to English-language publications reads as follows. Engl. pat. 514619 (1939), USA pat. 2233835 (1941), Engl. pat. 777306 (1959). [Abstracter's note: References no. 3 and no. 13 are the same.]

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X

S/191/62/000/006/005/016  
B110/B136

AUTHORS: Losev, I. P., Smirnova, O. V., Smurova, Ye. V.

TITLE: Preparation of polycarbonates by ester interchange between low-molecular polymers

PERIODICAL: Plasticheskiye massy, no. 6, 1962, 15-17

TEXT: An attempt was made to use the low-molecular condensation products from the synthesis of polycarbonates for synthesizing high-molecular polycarbonates. Ester interchange takes place in two stages with different temperatures, pressures, and durations. First stage: 2-3 hrs at 210-220°C, 50-60 mm Hg, inert gaseous atmosphere. Second stage: 5-6 hrs, gradual rise from 230 to 280°C, ~1 mm Hg. The optimum quantity of catalyst was determined using zinc oxide, and the initial material was polycarbonate of molecular weight 10,700. Molecular weights for 0.1, 0.5, and 1% catalysts were 28,000, 46,700, and 32,300, respectively; the yields were 74, 70, and 56%, respectively.  $Ti(OC_4H_9)_4$  increases the molecular weight only slightly as it takes part in the reaction with only 0.5-0.85%. The anatase and rutile modifications of  $TiO_2$  increased the molecular weight only slightly as it takes part in the reaction with only 0.5-0.85%.  
Card 1/2

Preparation of polycarbonates ...

S/191/62/000/006/005/016  
3110/B138

weight considerably and almost to the same extent (yields, 75-92%). Two-stage ester interchange leads to higher molecular weights. Ester interchange of low-molecular polycarbonates, obtained by interphase polycondensation without a catalyst, results in substantially lower molecular weights (6,300-15,000). The most efficient catalyst was found to be sodium acetate. There are 5 tables.

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IS 8112

10203  
S/191/62/000/009/002/012  
B101/B144

AUTHORS: Losev, I. P., Smirnova, O. V., Smurova, Ye. V.  
TITLE: Properties of polycarbonates synthesized by interesterification  
PERIODICAL: Plasticheskiye massy, no. 9, 1962, 10 - 13

TEXT: Polydispersity as well as mechanical, thermomechanical and electric properties of polycarbonates (PC), synthesized by interesterification, were investigated. Results: (1) Polydispersity of PC with a molecular weight (MW) of 9,000 - 27,000, determined by turbidimeter or by fractional precipitation, gave the usual form of distribution curve with a distinct maximum. (2) Thermomechanical test and X-ray diffraction study of PC (MW: 20,000 or 27,000) showed amorphous structure, but a marked micro-structure, owing to high rigidity of the molecule. The higher molecular weight did not affect the glass transition temperature ( $\sim 160^{\circ}\text{C}$ ) but it raised the yield point from  $230^{\circ}\text{C}$  (MW 20,000) to  $240^{\circ}\text{C}$  (MW 27,000). (3) Tests of a PC film (MW 25,000) at 20 and  $100^{\circ}\text{C}$  with a Polanyi apparatus showed high stretching deformation, especially at higher temperatures. (4) Irradiation of PC films for one month with  $\text{Co}^{60}$  (dose  $2330 \text{ mrad/cm}^2$ )

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S/190/63/005/001/008/020  
B101/B186

AUTHORS: Losev, I. P., Smirnova, O. V., Smurova, Ye. V.

TITLE: Kinetics of polycarbonate synthesis by interesterification of 4,4'-dihydroxy-diphenyl-2,2-propane and diphenyl carbonate

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 1, 1963, 57-62

TEXT: Interesterification of 4,4'-dihydroxy-diphenyl-2,2-propane (diane) with diphenyl carbonate was conducted in two consecutive stages: (a) during 2 hrs at 200 - 210°C and 50 - 70 mm Hg, and (b) during 5-6 hrs with the temperature slowly rising to 230 - 280°C and ~1 mm Hg. The kinetics of this reaction was examined: the first stage was investigated at 182, 198, and 216°C, the samples were taken 15 - 360 min after the reaction set in, the molecular weight of the polymer and the amount of liberated phenol were determined, and the degree P of conversion was calculated. Among the diagrams of P versus time,  $\ln P$  versus time, and  $P^2$  versus time used for the graphical determination of the order of reaction  $\ln P = f(t)$  was the only linear diagram. Hence interesterification was found to be a  
Card 1/2

LOSEV, I.P. [deceased]; SMIRNOVA, O.V.; KOROVINA, Ye.V.

Preparation of carbonic acid polyesters. Part 4: Synthesis and study of carbonic acid polyesters based on 1,1-(4,4'-dihydroxydiphenyl)cyclohexane and phosgene. Vysokom. soed. 5 no.10:1491-1495 0 '63. (MIRA 17:1)

1. Moskovskiy khimiko-tehnologicheskii institut imeni Mendeleyeva.

LOSEV, I.P. [deceased]; YEROFEYEVA, S.B.; SMIRNOVA, O.V.; D'YACHENKO, L.L.

Investigations in the field of the preparation of carbonic acid polyesters. Synthesis and study of carbonic acid polyesters based on 2,2-(3,3'-dichloro-4,4'-dihydroxydiphenyl)-propane and phosgene. Plast. massy no.11:8-11 '63. (MIRA 16:12)

LOSEV, I.P. [deceased]; SMIRNOVA, O.V.; KOROVINA, Ye.V.

Synthesis and study of carbonic acid polyesters. Part 5: Carbonic acid polyesters based on 2,2-di-(4-hydroxy-3,5-dibromophenyl) propane and phosgene. Vysokom.soed. 5 no.11:1603-1607 N '63. (MIRA 17:1)

1. Moskovskiy khimiko-tekhnologicheskii institut imeni Mendeleyeva.

POLYAKOVA, A.M., doktor khim. nauk; SMIRNOVA, O.V.

New glue. Priroda 52 no.9:111-112 '63.

(MIRA 16:11)

1..Institut elementoorganicheskikh soyedineniy AN SSSR, Moskva.

ACCESSION NR: AP4035099

S/0191/64/000/005/0013/0015

AUTHOR: Smirnova, O. V.; Losev, I. P. (Deceased); Yerofeyeva, S. B.;  
Zil'berman, Ye. G.

TITLE: Effect of emulsifiers on the course of the interphase polycondensation reaction in preparing polycarbonates based on dichlorodiphenylolpropane.

SOURCE: Plasticheskiye massy\*, no. 5, 1964, 13-15

TOPIC TAGS: emulsifier, interphase polycondensation, polycarbonate, dichlorodiphenylolpropane, dichlorodiphenylolpropane polycarbonate, Trilon B, leveling agent A, OP 7, Nekal, Avirol, molecular weight, yield, specific viscosity, polyether, solvent effect

ABSTRACT: The effect of certain emulsifiers on the molecular weight and the yield of polycarbonates based on a chlorinated dihydroxydiphenylalkane were investigated. The following emulsifiers were studied: Trilon B, leveling agent A (quaternary ammonium salt of diethylaminomethyl derivatives of polyethylene glycol esters of isooctylphenols), OP-7 (polyethylene glycol ester of isooctylphenol), Nekal, and Avirol (mixture of neutral esters of butanol, sulfuric and

Card 1/5

ACCESSION NR: AP4035099

oleic acids).  $\text{CCl}_4$  and  $\text{CH}_2\text{Cl}_2$  were selected for the organic phase. Experiments were run at optimum conditions as described by I. P. Losev, S. B. Yerofeyeva, O. V. Smirnova, L. L. D'yachenko (Plast. massy\*, no. 11, 1963). The enclosed figures 1-5 summarize the effects of the emulsifiers on the specific viscosity and yields of the polymer. The process of preparing polycarbonates based on 2,2-(3,3'-dichloro-4,4'-dihydroxyphenyl)-propane and phosgene depends on the nature of the organic phase and on the amount and nature of the emulsifier used. All the emulsifiers except Trilon B lower the specific viscosity of the polymer when the reaction was run in  $\text{CCl}_4$  in which the polymer is insoluble. Trilon B and the leveling agent A lead to an increase in molecular weight and in yield of the polycarbonate when reaction is run in  $\text{CH}_2\text{Cl}_2$  which dissolves the polyether formed. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 26May64

ENCL: 03

SUB CODE: 0C

NO REF SOV: 002

OTHER: 001

Card 2/5



ACCESSION NR: AP4035099

ENCLOSURE: 01

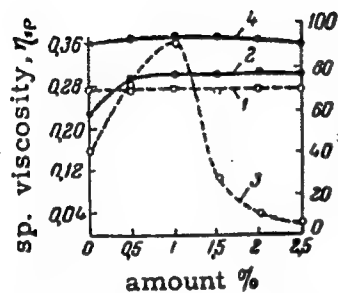


Fig. 1. Relationship between specific viscosity and yield of polyether and amount of Trilon B. ---specific viscosity; ——— yield. 1 and 2 - in carbon tetrachloride 3 and 4 - in methylene chloride

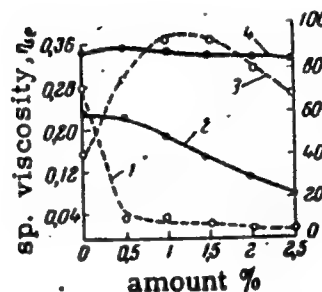


Fig. 2. Relationship between specific viscosity and yield of polyether and amount of leveling agent A. Symbols same as in fig. 1.

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ACCESSION NR: AP4035099

ENCLOSURE: 02

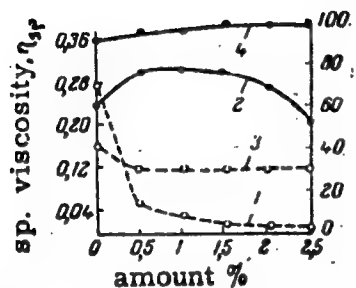


Fig. 3. Relationship between specific viscosity and yield of polyether and amount of OP-7.

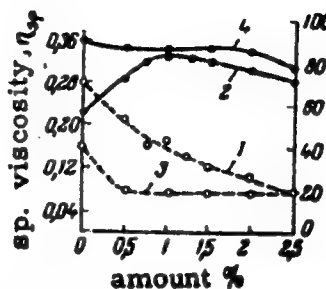


Fig. 4. Relationship between specific viscosity and yield of polyether and amount of Nekal.

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ACCESSION NR: APL4035099

ENCLOSURE: 03

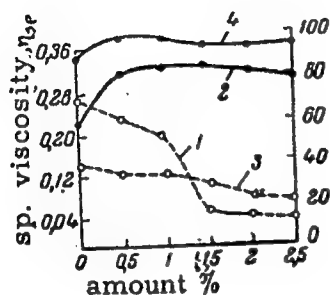


Fig. 5. Relationship between specific viscosity and yield of polyether and amount of Avirol. Symbols same as in fig. 1.

Card 5/5

ACCESSION NR: AP4041775

8/0191/64/000/007/0015/0017

AUTHOR: Losev, I. P. (deceased); Smirnova, O. V.; Yeofeyeva, S. B.

TITLE: Synthesis and investigation of polyesters of carbonic acid. Polyesters of carbonic acid based on 1,1-(4,4-dihydroxy-3,3'-dichlorodiphenyl)-cyclohexane and phosgene

SOURCE: Plasticheskiye massy\*, no. 7, 1964, 15-17

TOPIC TAGS: polyester, carbonic acid polyester, cyclohexane, phosgene, 1,1-(4,4-dihydroxy-3,3-dichlorodiphenyl)-cyclohexane, carbonic acid, polymer, polycondensation, heterophase polycondensation, polyester electrical property

ABSTRACT: Polyesters of carbonic acid based on 1,1-(3,3-dichloro-4,4-dihydroxydiphenyl)-cyclohexane were obtained by the method of heterophase polycondensation with phosgene. The average specific viscosity and yield of the polyesters was found to depend considerably on the concentration of the initial substances and their molar ratios. Polycondensation in carbon tetrachloride gave the best results at a concentration of 0.4 - 0.6 mol./liter. The optimal amount of alkali was 200% of the theoretical. A further increase in alkali led to a

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ACCESSION NR: AP4041775

decrease in the molecular weight and yield of the polyesters. The dependence of the specific viscosity and yield of polyesters on the amounts of catalyst and alkali, the concentration of initial substances, temperature and stirring rate is plotted. The best results were obtained with a slight excess of phosgene (20%). A stirring rate up to 2800 r.p.m. increased the yield of polyester. Regardless of the low molecular weight of the polymer, strong transparent films were obtained from a 15% polymer solution with methylene chloride. Films of a polymer having a mol. wt. of 18,000 had a tensile strength of 760 kg/cm<sup>2</sup> with 8% elongation. Introduction of the two chlorine atoms into the phenyl ring thus increases the rigidity of the polymer chains and the mechanical strength, and imparts the property of self-extinction to the polyester. The dielectric constant was 2.3-2.5 and the tangent of the angle of dielectric loss was 0.002. "The 1,1-(3,3'-dichloro-4,4'-dihydroxydiphenyl)-cyclohexane was provided by the personnel of the Vsesoyuznyy nauchno-issledovatel'skiy institut reaktivov (All-Union Scientific Research Institute for Reagents)." Orig. art. has: 7 figures and 1 structural formula.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 00

SUB CODE: OC, MT

NO REF SOV: 001

OTHER: 002

Card 2/2

ACCESSION NR: AP4030361

S/0190/64/006/003/0459/0462

AUTHORS: Smirnova, O. V.; Losev, I. P. (Deceased); Khorvat, E.

TITLE: The synthesis and investigation of polycarbonates by the interfacial polycondensation method. 4. Effect of excess of one of the components on the course of the interfacial polycondensation of 2,2'-bis-(4-hydroxyphenyl) propane and phosgene

SOURCE: Vy\*sokomolekulyarny\*ye soyedineniya, v. 6, no. 3, 1964, 459-462

TOPIC TAGS: polycondensation, polycarbonate, interfacial polycondensation, 2,2'-bis-(4-hydroxyphenyl) propane, phosgene, constant concentration method, constant volume method, organic phase, aqueous phase, dichloromethane, carbon tetrachloride, benzene, n-heptane

ABSTRACT: Solutions of 2,2'-bis-(4-hydroxyphenyl) propane (HPP) in n-heptane, carbon tetrachloride, benzene, and dichloromethane were prepared, having a concentration of 0.10 mole/liter and 0.02 mole/liter. Aqueous phosgene solutions of various concentrations were prepared, and the two phases were superimposed on each other, allowing interfacial polycondensation to take place in the presence of twice the amount of sodium hydroxide required for neutralizing the liberated hydrochloric

Card 1/2

ACCESSION NR: AP4030361

acid. One experimental approach consisted in keeping the concentrations of HPP and of phosgene identical, while in the other the volumes of the superimposed phases were kept even but the phases had different concentrations of HPP and phosgene. It was found that the highest yields and molecular weights were obtained at a 20-40% excess of phosgene over the HPP component requirement for an equimolar ratio. The nature of the solvent had no effect on the polycondensation. The same excess of phosgene produces a polycondensate of higher molecular weight under conditions of constant concentration of the phases, as compared with the constant volume setup. A large excess of phosgene causes the formation of low molecular weight fractions, as does a large excess of HPP, while the total yield of the polycondensate is higher. Orig. art. has: 2 tables.

ASSOCIATION: Moskovskiy khimico-tekhnologicheskii institut im. D. I. Mendeleeva  
(Moscow Chemical and Technological Institute)

SUBMITTED: 09Mar63

DATE ACQ: 07May64

ENCL: 00

SUB CODE: CH

NO REF SOV: 005

OTHER: 000

Card 2/2

ACCESSION NR: AP4030362

2/0190/64/006/003/0463/0469

AUTHORS: Smirnova, O. V.; Losov, I. P. (Deceased); Khervat, E.; Astasheva, I. B.

TITLE: The synthesis and investigation of polycarbonates by the interfacial polycondensation method. 5. Effect of the amount and concentration of sodium hydroxide on the course of the interfacial polycondensation of 2,2'-bis-4-(hydroxyphenyl) propane and phosgene

SOURCE: Vy\*sokomolekulyarny\*ye soyedineniya, v. 6, no. 3, 1964, 463-469

TOPIC TAGS: polycarbonate, dihydroxydiphenylalkane, 2,2'-bis-(4-hydroxyphenyl) propane, phosgene, polyester, sodium hydroxide, polycondensation, interfacial polycondensation, aqueous phase, organic phase, phenoxide ion, macromolecule

ABSTRACT: Equimolecular amounts of 2,2'-bis-(4-hydroxyphenyl) propane (HPP) and phosgene (in 0.01 - 1.0 mole/liter concentrations) were subjected to interfacial polycondensation in the presence of an equimolecular amount of sodium hydroxide in the aqueous phase. Polymers of low molecular weight (2000-8000) were obtained, irrespective of the nature of the organic phase, while the addition of a 100-300% excess sodium hydroxide caused an increase in the molecular weight of the polymers,

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ACCESSION NR: AP4030362

the magnitude of which varied with the solvent. Thus, at 0.1 mole/liter concentrations of the reacting components, an organic phase of carbon tetrachloride yielded a polycarbonate with a molecular weight of 65 000, as against a maximum of only 40 000 from an n-heptane phase and 10 000 and 7 800 from benzene and methylene-chloride phases, respectively. The yield of polycarbonates increased with higher concentrations of sodium hydroxide, reaching in carbon tetrachloride and n-heptane phases a maximum coinciding with maximum molecular weight, declining thereafter. In benzene and methylenechloride phases, on the other hand, the yield continued to climb long after the maximum molecular weight had been reached. It was also found that the degree of phosgene hydrolysis increased with higher concentrations of sodium hydroxide and that it depended on the nature of the organic phase. A 10-30% excess phosgene over the equimolecular ratio proved beneficial in achieving optimal yields and molecular weights of the polymers. While further additions of phosgene continued to increase the yield of the polycarbonate, its molecular weight declined. An excess of HPP over the equimolecular ratio with phosgene led to similar results. The authors conclude that a large excess of sodium hydroxide is required for optimal results in the HPP-phosgene interphase polycondensation reaction. Orig. art. has: 4 charts and 1 table.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleeva

Card 2/3

ACCESSION NR: APh032559

S/0190/64/006/004/0594/0599

AUTHORS: Smirnova, O. V.; Losev, I. P. (Deceased); Khorvat, E.

TITLE: Synthesis and investigation of polycarbonates by the method of interfacial polycondensation. 6. Effect of emulsifiers on the course of interfacial polycondensation of 2,2'-bis-(4-hydroxyphenyl) propane and phosgene, and on the rate of phosgene hydrolysis

SOURCE: Vyssokomolek. soedin., v. 6, no. 4, 1964, 594-599

TOPIC TAGS: polycarbonate, polycondensation, interfacial polycondensation, hydroxyphenylpropane, phosgene, surface active substance, emulsifier, sodium oleate, sodium lauryl sulfate, OP 10, n heptane, carbon tetrachloride, benzene, methylene chloride, hydrolysis

ABSTRACT: Tests were conducted on the emulsifiers sodium oleate, sodium laurylsulfate, and the polyethyleneglycol ester of isooctylphenol (OP-10), which constituted up to 0.40% of the aqueous phase. The medium of the organic phase consisted of n-heptane, carbon tetrachloride, benzene, or methylene chloride. The mixing rate was 4200 rpm. It was found that the effect of the emulsifiers depended

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ACCESSION NR: AP4032559

on their nature, their concentration, and on the nature of the organic phase. Thus, in the presence of sodium oleate, only small concentrations of the latter (0.05%) and an organic phase of benzene resulted in increased molecular weight of the 2,2'-bis-(4-hydroxyphenyl) propane (HPP) polycondensate. With sodium laurylsulfate, a sixfold increase in molecular weight of HPP was obtained where benzene was the organic phase, as against only a twofold increase with a methylene chloride solvent. OP-10 yielded a polycondensate of higher molecular weight only with methylene chloride as the organic phase. It was found that an increase in molecular weight of HPP could be obtained only in an alkaline medium (the concentration used in the investigation amounted to 0.20 mole/liter of NaOH). The rate of phosgene hydrolysis in the process of interfacial polycondensation was recorded simultaneously with a determination of the amount of the polymer dissolved in the organic phase. It was observed that the rate depended strongly on the nature of the emulsifier and of the organic phase. For example, in the presence of sodium laurylsulfate and n-heptane, the expenditure of phosgene increased 3.5 times. The presence of an emulsifier was also found to affect the amount of polymer dissolved in the organic phase. The authors present a discussion of the theoretical aspects of interfacial polycondensation. Orig. art. has: 3 charts and 2 tables.

Card 2/3

ACCESSION NR: AP4032559

ASSOCIATION: Moscovskiy khimico-tekhnologicheskii institut im. D. I. Mendeleyeva  
(Moscow Chemicotechnological Institute)

SUBMITTED: 25Mar63

DATE ACQ: 11May64

ENCL: 00

SUB CODE: GC

NO REF SOV: 003

OTHER: 002

Card 3/3

L 52131-65 EPF(c)/EPR/EWP(j)/EWA(c)/EWT(m)/T PC-4/Pr-4/PS-4 RPL WW/RM  
UR/0286/65/000/009/0067/0068

ACCESSION NR: AP5015293

AUTHORS: Losev, I. P. (deceased); Smirnova, O. V.; Yarovaya, S. B.

TITLE: A method for obtaining polycarbonates. Class 39, No. 170665

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 67-68

TOPIC TAGS: polycarbonate, phenol, phosgene

ABSTRACT: This Author Certificate presents a method for obtaining polycarbonates by means of the interphase polycondensation of diphenol and phosgene at room temperature in the presence of a catalyst. To raise the heat and fire resistance of the polycarbonates and to increase the assortment of polycarbonates, 2,2-di-(3-fluoro-4-hydroxyphenyl)-propane is used as diphenol.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleeva (Moscow Institute of Chemical Engineering)

SUBMITTED: 07Apr64

ENCL: 00

SUB CODE: 00

NO REF SOV: 000

OTHER: 000

Card 1/17MB

L 33509-65 EWT(m)/EPF(c)/EWP(j)/EWA(c)/I PC-4/Pr-4 RPL RM/JW  
S/0190/65/007/001/0129/0134  
ACCESSION NR: AP5003834

AUTHORS: Kolesnikov, G. S.; El' Said Ali Khasan; Smirnova, O. V.

TITLE: Mechanism of the catalytic action in the synthesis of polycarbonates by  
interfacial polycondensation

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 1, 1965, 129-134

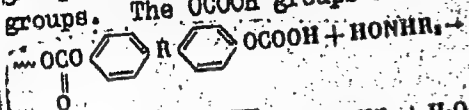
TOPIC TAGS: polycarbonate, interfacial polycondensation, tertiary amine, phosgene

ABSTRACT: The catalytic activity of tertiary amines and salts of quaternary ammonium bases in the synthesis of polycarbonates from phosgene and diphenols was investigated. Synthesis of polycarbonates from 2,2-di-(4-oxy-3-methylphenyl) propane with triethylamine (I), triethylbenzylammoniumchloride (II), dimethylphenylbenzylammoniumchloride (III), tetraethylammoniumchloride (IV), tetraethylammoniumbromide (V), tetrabutylammoniumiodide (VI), triethylmethylammoniumbromide (VII), and hexamethylenetetramine (VIII) catalysts showed that catalysts I and II gave best results (89 and 92% yield). Solubility data indicated that the catalyst effectiveness depended on the solubility of its complex with phosgene in the organic solvent and its ability to dissociate when reacting with phosgene. Based on the reaction data, the role of the catalyst was hypothesized as follows: in polycarbonate synthesis from phosgene or diphenols, part of the chloroformate  
Card 1/3

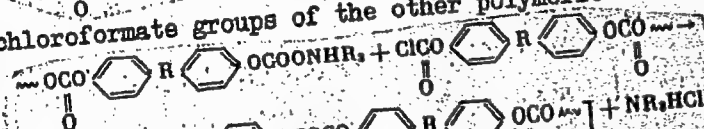
L 33509-65

ACCESSION NR: AP5003834

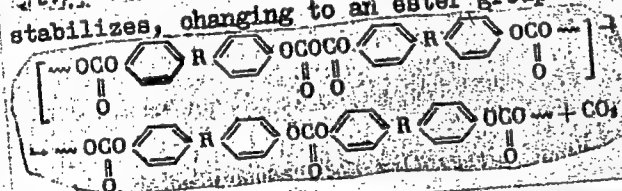
group saponify to OCOOH groups which react very slowly (if at all) with NaOAr groups. The OCOOH groups react with I (or another tertiary amine), forming the salt



$\sim\text{OCO} \begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array} \text{C}_6\text{H}_4 \text{R} \text{C}_6\text{H}_4 \text{OCOONHR} + \text{H}_2\text{O}$ . The salt reacts with the nonhydrolyzed chloroformate groups of the other polymeric or oligomeric molecule



$\sim\text{OCO} \begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array} \text{C}_6\text{H}_4 \text{R} \text{C}_6\text{H}_4 \text{OCOCO} \begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array} \text{C}_6\text{H}_4 \text{R} \text{C}_6\text{H}_4 \text{OCO} \sim + \text{NR}_3\text{HCl}$ . The anhydride ester group stabilizes, changing to an ester group with formation of  $\text{CO}_2$ , as shown by



$\sim\text{OCO} \begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array} \text{C}_6\text{H}_4 \text{R} \text{C}_6\text{H}_4 \text{OCO} \begin{array}{c} \text{O} \\ \parallel \\ \text{C} \end{array} \text{C}_6\text{H}_4 \text{R} \text{C}_6\text{H}_4 \text{OCO} \sim + \text{CO}_2$ . Thus, in the presence of a catalyzer,

L 33509-65

ACCESSION NR: AP5003834

partial hydrolysis of the chloroformate group does not stop the polymer chain growth, and a higher-molecular polycarbonate is produced. Tertiary amines and salts of quaternary ammonium bases which do not form insoluble products with phosgene are active catalysts, while only salts of quaternary ammonium bases (capable of undergoing the Stevens transformation to tertiary amines) are active. Orig. art. has: 2 tables and 9 formulas.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva  
(Moscow Chemico-Technical Institute)

SUBMITTED: 24Mar64

ENCL: 00

SUB CODE: 00

NO REF SOV: 002

OTHER: 004



L 38636-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AP5008376

S/0190/65/007/003/0503/0508

AUTHORS: Smirnova, O. V.; El' Said Ali Khasan; Kolesnikov, G. S.; Losev, I. P.  
(deceased)

TITLE: Synthesis and study of polycarbonates from 2,2-di-(4-hydroxy-3-methylphenyl) propane and 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 3, 1965, 503-508, and insert facing p. 435

TOPIC TAGS: polycarbonate, propane, cyclohexane, phosgene, polycondensation

ABSTRACT: The 2,2-di-(4-hydroxy-3-methylphenyl) propane was obtained by condensation of O-cresol and acetone in the molar ratios of 5:1 in toluene with dry HCl as a catalyst. The precipitated material was filtered and recrystallized from dilute acetic acid. The 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane was similarly obtained from O-cresol and cyclohexanone (same 5:1 ratio). The polycarbonates were obtained by interfacial polycondensation, using solutions of diphenyls in aqueous solutions of caustic soda and solutions of phosgene in organic solvents. The reaction was carried out at room temperature for 1 hour. It was found that of  $\text{CH}_2\text{Cl}_2$ ,  $\text{CHCl}_3$ , and  $\text{CCl}_4$  the first is the best solvent for phosgene.

Card 1/2

L 38636-65

ACCESSION NR: AP5008376

in performing polycondensation. The optimal amount of alkali, however, is practically independent of the solvent used. The physical-mechanical and electrical properties of the polycarbonates were tested, and these properties have been tabulated. The dielectric constant was found to be high, having a value characteristic of neutral or slightly polar polymers. The glass and flow temperatures are lower than for polycarbonates obtained from dian. The authors conclude that the polycarbonates obtained by them may be used for electrical insulators at frequencies up to 4.8 megacycles and temperatures up to 85C (polycarbonate from propane) and 120C (polycarbonate from cyclohexane). They are resistant to aqueous solutions of caustic soda, which (in the authors' opinion) is due to the presence of the CH<sub>3</sub> group in the aromatic rings of the diphenyls. Orig. art. has: 7 figures and 3 tables.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva  
(Moscow Institute of Chemical Engineering)

SUBMITTED: 04Jun64

ENCL: 00

SUB CODE: OC, MI

NO REF SOV: 003

OTHER: 005

Card 2/2 *ps*

L 51308-65 EPA(s)-2/ENT(m)/ENP(j) Pc-4/Pt-7 RM  
ACCESSION NR: AP5011255 UR/0190/65/007/004/0729/0733

AUTHORS: El' Said Ali Khasan; Kolesnikov, G. S.; Smirnova, O. V.; Losev, I. P.  
(Deceased)

TITLE: Synthesis and study of mixed polycarbonates from 2,2-di-(4-hydroxy-3,5-dichlorophenyl) propane

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 4, 1965, 729-733

TOPIC TAGS: organic synthesis, carbonate, propane, electric property, glass transition temperature, ordered structure

ABSTRACT: Mixed polycarbonates were synthesized from mixtures of 2,2-di-(4-hydroxy-3,5-dichlorophenyl) propane (1), di-(4-hydroxy-3-methylphenyl) methane (2), 2,2-di-(4-hydroxy-3-methylphenyl) propane (3), 1,1-di-(4-hydroxy-3-methylphenyl)-cyclohexane (4), and di(4-hydroxy-2-methylphenyl)phenylmethane (5). The dielectric and mechanical properties of the resulting polycarbonates were tested and the data tabulated. It was found that only the polycarbonates from (1) + (4) and (1) + (5) in equal molar ratios have high volume resistivity at a voltage of 1000 v. The dielectric constant declines with increase in frequency of the electric field. All of the polycarbonates are very stable in the presence of caustic

Card: 1/2

L 51308-65

ACCESSION NR: AP5011255

soda. Replacement of one unit by another in the polycarbonates is manifested in isomorphic substitution, leading to a steady increase in the glass point with increase of units that contain residue of (1). On heating to temperatures somewhat above the glass point, the ordering of the polymer is increased. Orig. art. has: 2 figures and 5 tables.

ASSOCIATION: Moskovskiy khimiko-tehnologicheskii institut im. D. I. Mendeleeva  
(Moscow Chemical Engineering Institute)

SUBMITTED: 01Jul64

ENCL: 00

SUB CODE: 00, 00

NO REF SOV: 001

OTHER: 003

308  
Card 2/2

L 27328-66 EWT(m)/EWP(j)/T IJP(c) RM  
 ACC NR: AP6008984 (A) SOURCE CODE: UR/0190/65/007/011/1989/1992

AUTHORS: Smirnova, O. V.; Fortunatov, O. G.; Garbar, N. M.; Kolesnikov, G. S. 37

ORG: Moscow Institute of Chemical Technology im. D. I. Mendeleev (Moskovskiy khimiko-tekhnologicheskii institut) B

TITLE: Synthesis and investigation of polycarbonates prepared by interphase polycondensation of di-(4-hydroxyphenyl)-phenylmethane 1

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1989-1992

TOPIC TAGS: polymer, polycarbonate plastic, polymer chemistry, polymerization, sodium hydroxide

ABSTRACT: This investigation was undertaken to extend the work of H. Schnell (Indust. and Engng. Chem., 51, 157, 1959) on the synthesis of polycarbonates. The reaction of di-(4-oxyphenyl)phenylmethane with phosgene was investigated. The conditions for maximum yield of product and the effect of NaOH concentration and the initial concentration of reactants on the yield and on specific viscosity were determined. The experimental results are presented graphically and are in good agreement with those obtained by El' Said Ali Khasan (Dissertatsiya, 1964) for the synthesis of polycarbonates from methyl- or chloro-substituted diphenyls. Orig. art. has: 3 graphs.

SUB CODE: 07, 11/SUBM DATE: 31Dec64/ ORIG REF: 002/ OTH REF: 001 2

Card 1/1 50 UDC: 541.64+678.674

L 18418-66 EWT(m)/EWP(j)/T JW/RM  
ACC NR: AP6003426 (A)

SOURCE CODE: UK/0190/66/008/001/0146/0152

AUTHORS: Smirnova, O. V.; Kolesnikov, G. S.; Vlasova, V. A.; Nadir, R. K. 37

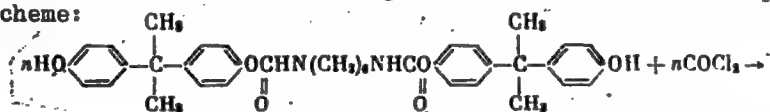
ORG: Moscow Institute of Chemical Engineering im. D. I. Mendeleyev (Moskovskiy khimiko-tehnologicheskii institut) B

TITLE: Synthesis and investigation of the properties of polyurethane carbonate 7  
based on 4-[2-(4-hydroxyphenyl)isopropyl]-phenyl ester of hexamethylene dicarbamic acid and phosgene 1

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 1, 1966, 146-152

TOPIC TAGS: polyurethane, polycondensation, phosgene, polymer structure

ABSTRACT: The effect of reagent concentration, excess of alkali and phosgene, presence of emulsifiers, and number of phosgenations upon interphase suspension polycondensation of 4-[2-(4-hydroxyphenyl)isopropyl]-phenyl ester of hexamethylene dicarbamic acid and phosgene has been investigated. The basic reaction proceeds according to the scheme:

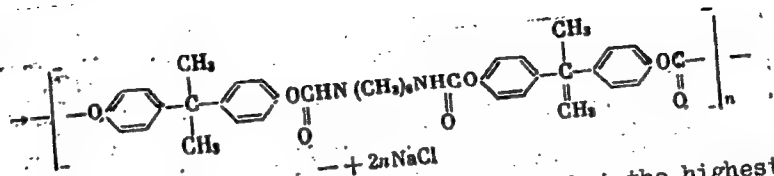


Card 1/2

UDC: 678.01:53+678.664+678.674 2

L 18418-66

ACC NR: AP6003426



yielding polyurethane carbonate (I). It was established that the highest values for reduced viscosity (0.42) and highest yield of I (40%) are obtained with the reagent concentration of 0.4 mole/l and at 40% excess of phosgene. Five phosgenations yielded 65% of I having  $\eta = 1.2$ . Its physical and chemical properties were determined. (I) was remarkably inert to alkaline hydrolysis and to organic solvents. Orig. art. has: 2 tables, 5 figures, and 1 equation.

SUB CODE: 07/ SUBM DATE: 04Mar65/ ORIG REF: 001/ OTH REF: 004

Card 2/2 *per*

L 24489-66 EWT(m)/EWP(j)/T/ETC(m)-6 IJP(c) WW/RM  
ACC NR: AP6006984 (A) SOURCE CODE: UR/0190/66/008/002/0302/0307

AUTHORS: Smirnova, O. V.; Kolesnikov, G. S.; Vlasova, M. A.; Ledneva, O. A. 53  
50

ORG: Moscow Institute of Chemical Technology im. D. I. Mendeleev (Moskovskiy  
khimiko-tekhnologicheskii institut) B

TITLE: Synthesis and study of the properties of polyurethane carbonate based on  
4-/2-(3-methyl-4-hydroxyphenyl)isopropyl/-2-methylphenyl ester of hexamethylene  
dicarbamic acid and phosgene 1

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 2, 1966, 302-307

TOPIC TAGS: organic synthetic process, polycarbonate plastic, thermomechanical  
property/ PKU-2 polyurethane plastic 15

ABSTRACT: Synthesis and properties of polyurethane carbonate PKU-2 (I) based on  
4-/2-(3-methyl-4-hydroxyphenyl)isopropyl/-2-methyl ester of hexamethylene  
dicarbamic acid (II) and phosgene (III) are described. The material, having a  
molecular weight of 20 000 and an elementary unit represented by the formula 15

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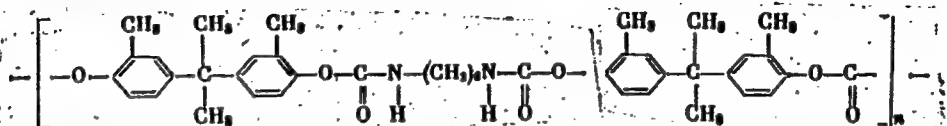
UDC: 541.64+678.674 2



L 24489-66

ACC NR: AP6006984

3



was of interest as it was expected to combine the excellent mechanical properties of polycarbonates with higher elasticity and alkali resistance. Compound II has been synthesized for the first time, by reacting 2,2-di-(3-methyl-4-hydroxyphenyl)-propane with hexamethylene diisocyanate. I was prepared by interphase polycondensation in suspension. Study of the yield and viscosity of the product as functions of the reaction conditions is summarized graphically. Optimal concentration of reagents was found to be 0.2 mol/l. Phosgenation repeated three times increased the yield from 15 to 45%. Comparison of the thermomechanical properties of I with those of homopolycarbonate is illustrated in Fig. 1. The product was resistant to alkaline hydrolysis and to organic solvents.

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L 24489-66

ACC NR: AP6006984

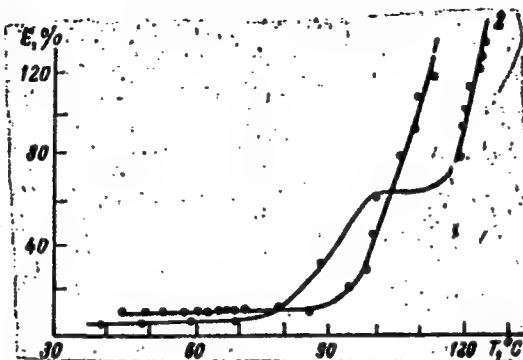


Fig. 1. Thermomechanical curves:  
1 - homopolycarbonate, 2 - PKU-2.

Orig. art. has: 3 figures.

SUB CODE: 07/ SUBM DATE: 19Mar65/ ORIG REF: 003

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PB

L 38730-66 EWT(1)/EWT(m)/EWP(j)/T IJP(c) RM/WW/RO

ACC NR: AP6012716

(A)

SOURCE CODE: UR/0190/66/008/004/0708/0712

AUTHOR: Smirnova, O. V.; Korovina, Ye. V.; Kolesnikov, G. S.; Lipkin, A. M.  
Kuzina, S. I.

ORG: Moscow Institute of Chemical Technology im. D. I. Mendeleev (Moskovskiy khimiko-tehnologicheskii institut)

TITLE: Synthesis and investigation of polycarbonate from cyclopentane and phosgene

SOURCE: Vysokomolekulyarnyye soyedineniya, v. i, no. 4, 1966, 708-712

TOPIC TAGS: phosgene, cyclopentane, polycarbonate, polycondensation

ABSTRACT: A polycarbonate from 1,1-di-(4-hydroxyphenyl) cyclopentane was synthesized by the condensation of cyclopentanone with phenol. The polycarbonate was prepared by means of interphase polycondensation. Optimum conditions were established for the polycarbonate synthesis and its physical, mechanical and dielectric properties were determined. It was found that transparent polycarbonate films prepared from a 20% solution in methylene chloride are suited for use at elevated temperatures. Orig. art. has: 5 figures. [NT]

SUB CODE: 11, 07/ SUBM DATE: 28Apr65/ ORIG REF: 006/ OTH REF: 001

Card

1/1

UDC: 541.64+678.674

L 45687-66 SYM (M) TYPE (1) (T) INFO 25/3M  
ACC NR: AP6024050 (A)

SOURCE CODE: UR/0191/66/000/005/0043/0046

AUTHOR: Smirnova, O. V.; Yerofeyeva, S. B.

ORG: none

TITLE: Some properties of chlorinated polycarbonates<sup>1</sup>

SOURCE: Plasticheskiye massy, no. 5, 1966, 43-46

TOPIC TAGS: polycarbonate plastic, amorphous polymer, polymer stability, polymer heat resistance, polymer physical property

ABSTRACT: In order to determine the technical value of chlorinated polycarbonates, their polydispersity, thermal stability, thermomechanical and chemical properties, and also the properties of their films were studied on samples with an average molecular weight of 25,000. The thermomechanical curves showed a considerable rigidity and the absence of a highly elastic state because of the rigidity of the molecules themselves; this results in a looseness of packing in the vitreous state. Thus, the polycarbonate films displayed an appreciable deformation (several percent). The polycarbonates were stable up to 300°C. X-ray structural analysis showed the presence of an amorphous and an ordered region. The x-ray and thermomechanical data indicate that the polycarbonates are basically amorphous polymers with an ordered structure in the microregions. It is shown that in thermal stability and moisture resistance the chlorinated polycarbonate films match polyethylene terephthalate (dacron, mylar) films, and are

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UDC: 678.674'45'5.01 : 536.495 : 537.226 : 54

ACC NR: AP6024050

slightly inferior to diacetate films in strength. Orig. art. has: 10 tables.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 005

Card

2/2 *MT*

L 37215-66 EWP(j)/EWT(m)/T IJP(c) RM/WW

ACC NR: AP6018127 (A) SOURCE CODE: UR/0191/66/000/006/0040/0042

AUTHOR: Kovarskaya, B. M.; Kolesnikov, G. S.; Levantovskaya, I. I.; Smirnova, O. V.; Drakyuk, G. V.; Poletakhina, L. S.; Korovina, Ye. V. 41 B

ORG: none

TITLE: Thermo-oxidative degradation of polycarbonates 15

SOURCE: Plasticheskiye massy, no. 6, 1966, 40-42

TOPIC TAGS: polycarbonate plastic, heat resistance, oxidative degradation, oxidation kinetics, reaction mechanism

ABSTRACT: Polycarbonates, molecular weight of about 30,000, based on 2,2-di-(4-hydroxyphenyl)-propane (PK-1), on 1,1-di-(4-hydroxyphenyl)-cyclohexane (PK-2) and on di-(4-hydroxyphenyl)-phenylmethane (PK-3) were subjected to thermal oxidation in vacuum. Kinetic curves of the thermal oxidations showed PK-1 was most stable and PK-3 the least stable. Energies of activation for the oxidations were calculated: 21.0, 17.6 and 13.0 kcal/mol, respectively. Reaction mechanisms are discussed. Auto-accelerated processes are indicated in the initial period of thermal oxidation of PK-1 and PK-2. Radical-chain oxidation

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UDC: 678.674'41'5.01:620.192.424

L 37215-66

ACC NR: AP6018127

mechanisms are indicated for all three materials. It is concluded that polycarbonates with increased resistance to thermal oxidation should contain a minimum number of "aliphatic" hydrogen atoms in the main polymer chain and the bisphenols with aliphatic carbon atoms bonded to hydrogen. Orig. art. has: 3 figures, 6 equations and 2 formulas.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 009/ OTH REF: 002

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Card 2/2

L 08795-67 EWT(m)/EWP(j) IJP(c) RM

ACC NR: AP6030847

(A, N)

SOURCE CODE: UR/0191/66/000/009/0020/0022 2

AUTHOR: Kolesnikov, G. S.; Kotrelev, V. N.; Kostryukova, T. D.; Lyamkina, Z. V.;  
Pechenkin, A. A.; Smirnova, O. V.; Korovina, Ye. V.

ORG: none

TITLE: Film materials based on polycarbonate "ilon"

SOURCE: Plasticheskiye massy, no. 9, 1966, 20-22

TOPIC TAGS: polycarbonate plastic, synthetic material, polymer, dielectric layer, polymer dielectric, dielectric material

ABSTRACT: Physicomechanical, structural, and dielectric properties of the polycarbonate "ilon" films prepared from 1,1-di-(4-oxyphenyl)-cyclohexane and phosgene were studied in the temperature range from 60 to 210°C. It was found that the tensile strength of the ilon films was a function of the molecular weight of the polycarbonate. The softening point of the ilon films was found to be approximately 160-170°C. It was also found that the structure of the ilon films is less regular than that of the "diflon"-films [diflon is a brand name of a commercial polycarbonate resin]. It was found that ilon films exhibit constant dielectric properties in the range from -60 to +170°C. It is concluded that the ilon films are superior to diflon films for application as dielectric films. Orig. art. has: 5 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: 00/ ORIG REF: 003/ OTH REF: 002

Card 1/1 not

UDC: 678.673.41.5.06-416



I 00632-6Z EWT(1)/EWT(m)/I/EWP(j) IJP(c) RO/RM

ACC NR: AP6012715

SOURCE CODE: UR/0190/66/008/004/0703/0707

AUTHOR: Kolesnikov, G. S.; Smirnova, O. V.; El' Said Ali Khasan

ORG: Moscow Institute of Chemical Technology im. D. I. Mendeleev (Moskovskiy khimikotekhnologicheskii institut)

TITLE: Mixed polycarbonates from di-(4-hydroxy-3-methylphenol) methane

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 4, 1966, 703-707

TOPIC TAGS: phosgene, propane, cyclohexane, methane, polycarbonate, polymer, dielectric property

ABSTRACT: By interaction of phosgene with mixtures of di-(4-hydroxy-3-methylphenyl) methane with the 2,2-di-(4-hydroxy-3-methylphenyl) propane, 1,1-di-(4-hydroxy-3-methylphenyl) cyclohexane, and di-(4-hydroxy-2-phenyl-methyl) phenylmethane, mixed polycarbonates of different compositions were synthesized. The second-order transition temperatures of the mixed polycarbonates changed monotonously with changes in their composition, indicating the isomorphous substitution of the main polymer links in the exchange of one diphenole for another. The mechanical and dielectric properties of films of the mixed polycarbonates were determined. The hydrolytic resistance of the mixed polycarbonates obtained with 9 N NaOH is considerably higher than that of polycarbonates based on diene. Orig. art. has: 1 figure and 5 tables. [Based on authors' abstract] [NT]

SUB CODE: 11, 07/ SUBM DATE: 28Apr65/ ORIG REF: 003/ OTH REF: 001  
Card 1/1 pb UDC: 678.674

LASTY, I.P. (Moscow), SHENOVA, O.V.; YEROFEEVA, I.B.

Synthesis and analysis of the polymers of carbonic acid. Carbonic acid polyesters based on 1,3-(4,4'-dihydroxy-2,2'-dichlorodiphenyl)-4,4'-cyclohexene and phosgene. Plast.masy no.7 15-17 '64.  
(MIRA 17-10)

L 16799-63

EPA/EPR/EPF(c)/EWT(m)/BDS

AFFTC/ASD/APGC

Paa-l/Ps-l/

Pr-l BW/WW/DJ

76  
75

ACCESSION NR: AP3006475

S/0145/63/000/004/0058/0079

AUTHOR: Berger, Ye. G. (Candidate of technical sciences, Assistant); Kel'zon, A. S. (Candidate of technical sciences, Docent); Pryadilov, V. I. (Docent); Smirnova, O. Ye. (Engineer); Troitskaya, Z. V. (Engineer); Shpeyzman, R. L. (Engineer)

TITLE: Investigating vibrations of a system of coaxial rotors

SOURCE: IVUZ. Mashinostroyeniye, no. 4, 1963, 58-79

TOPIC TAGS: aircraft turbine, gas turbine, self centering, self aligning, turbine compressor, free turbine, rotor, coaxial rotor, high speed turbine, vibration, elastic bearing, rigid bearing, damped bearing, critical revolution, vibration amplitude, vibration free

ABSTRACT: The object of the investigation was the self-aligning dynamic conditions in aviation gas turbine engines, consisting of a compressor, a compressor turbine, and a free turbine. The system investigated consisted of an aircraft gas turbine engine with an

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3

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ACCESSION NR: AP3006475

8-stage axial compressor flexibly coupled with the turbine and a free turbine. The free turbine was mounted coaxially with the compressor turbine (Fig. 2) but rotated independently. The engine operated in the range of 25,000 to 45,000 rpm. The compressor and turbine used the full range of operational velocities; the free turbine did not exceed 25,000 rpm. The experimental study was made with an 8-stage compressor having a rigid horizontal shaft on two bearings — either or both elastic or rigid. The various relationships derived are presented graphically in Figs. 3-5. It is shown that self-aligning conditions may be achieved by adequate design of the rigid and elastic bearings. Self-aligning may occur in coaxial rotors of any type after passing the critical speed. Apart from the system shown in Fig. 6 of the Enclosure, other self-aligning systems exist. It is characteristic of these systems that both bearings situated between the coaxial rotors are rigid and the mounting of the system to the stationary turbine body secures 4 degrees of freedom without counting the rotor revolution. In this category of coaxial rotors, the amplitudes of vibrations increase

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